

# Strand B: Diversity of Living Things

- **BIG IDEAS:**

- All living things can be classified according to their anatomical and physiological characteristics
- Human activities affect the diversity of living things in ecosystems

# The Nature of Classification

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## Lesson 3.2

- For hundreds of years people have been trying to classify the species on our planet
- There are potentially hundreds of thousands new species still waiting to be discovered
- With the discovery of new species, the classification of organisms is constantly being modified
- The goal is to track evolution and determine which organisms share common ancestors

- A simple system of naming organisms allows anyone in the world to discuss the same creature regardless of its common name
- For example....

Sphringer Sauterelle



Heuschrecke

Cavalletta

Grasshopper

- But, Carolus Linnaeus calls him....

*Melanoplus femurrubrum*

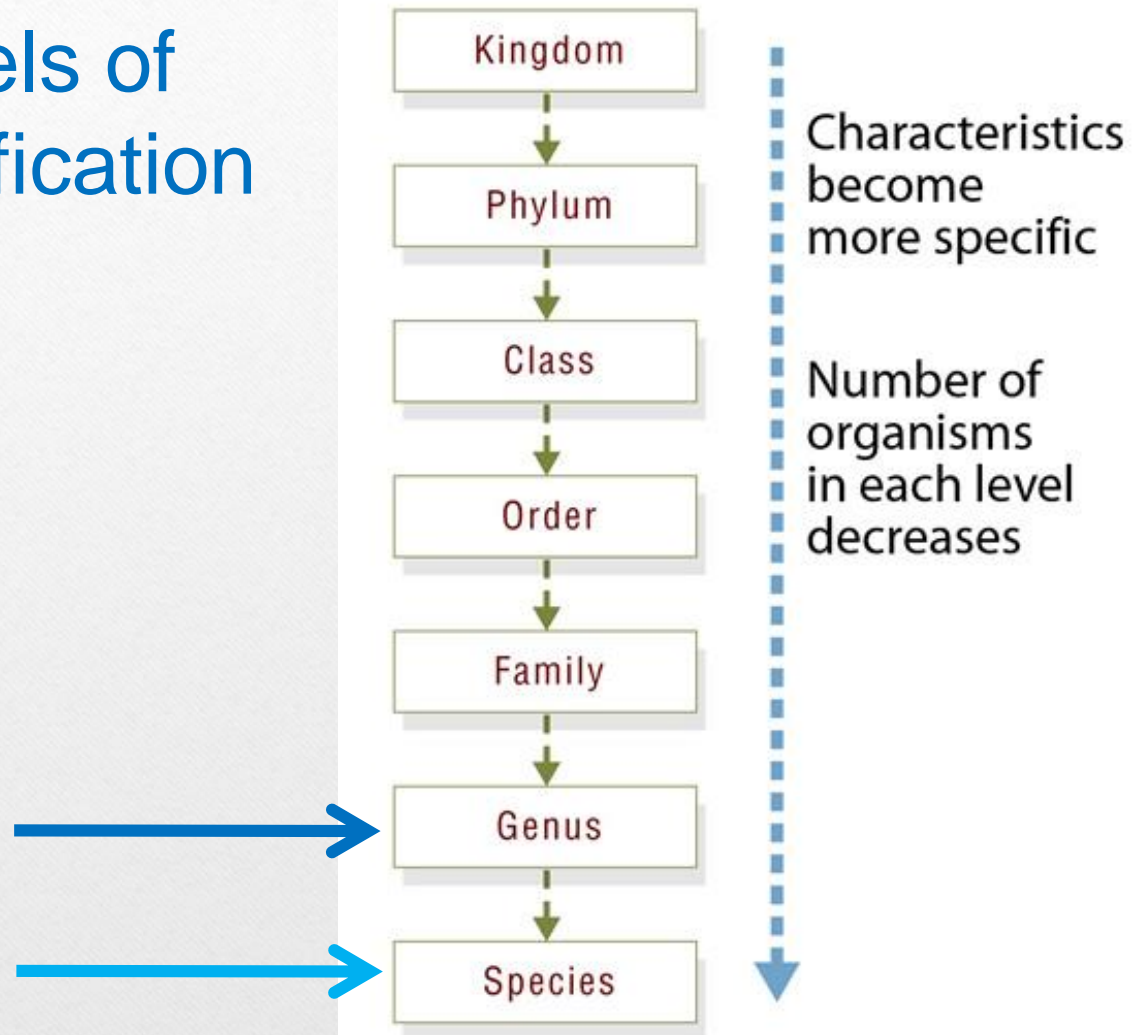


- The 18<sup>th</sup> century Swedish naturalist Carolus Linnaeus classified organisms according to their structural similarities: this is called TAXONOMY
- Each group to which Linnaeus assigned organisms is called a TAXA (singular is TAXON)
- Modern taxonomy groups are based on their evolutionary relatedness; this is called PHYLOGENY.
- Organisms share common ancestry if they show similar stages of embryological development and anatomical structures.

- Linnaeus also simplified the system of naming and classifying organisms
- The system, known as **binomial nomenclature** is still in use today!
- What are the two parts?!

Let's find out.....

# Levels of Classification



# Linnean Classification

Kingdom.....Animalia

Phylum.....Chordata

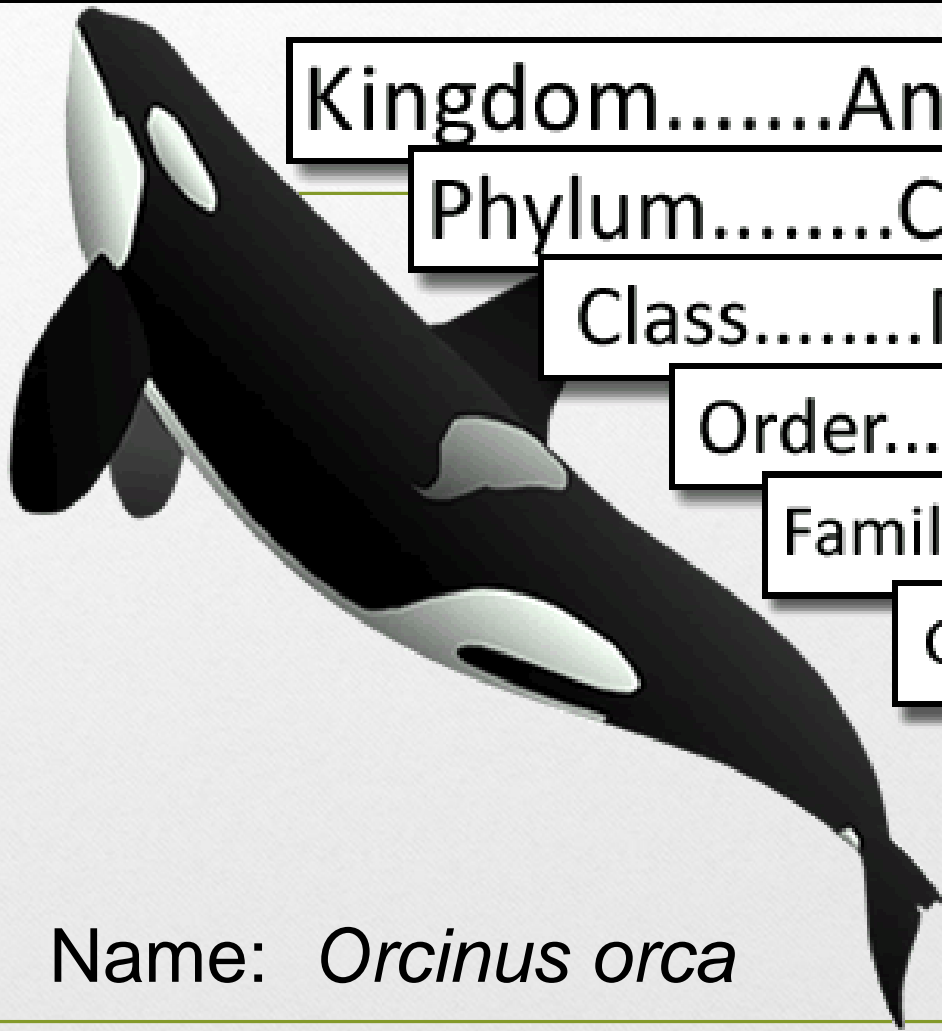
Class.....Mammalia

Order.....Cetacea

Family....Delphinidae

Genus.....*Orcinus*

Species.....*orca*



Name: *Orcinus orca*

- The taxon “species” is the smallest group and it contains only a single type of organism.
- The organisms in a species are most like one another
- The individuals of a species have the same body or physiological morphology.

# How Many Kingdoms?

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In Canada, we classify organisms  
into one of six kingdoms:



Bacteria



Archaea



Protists



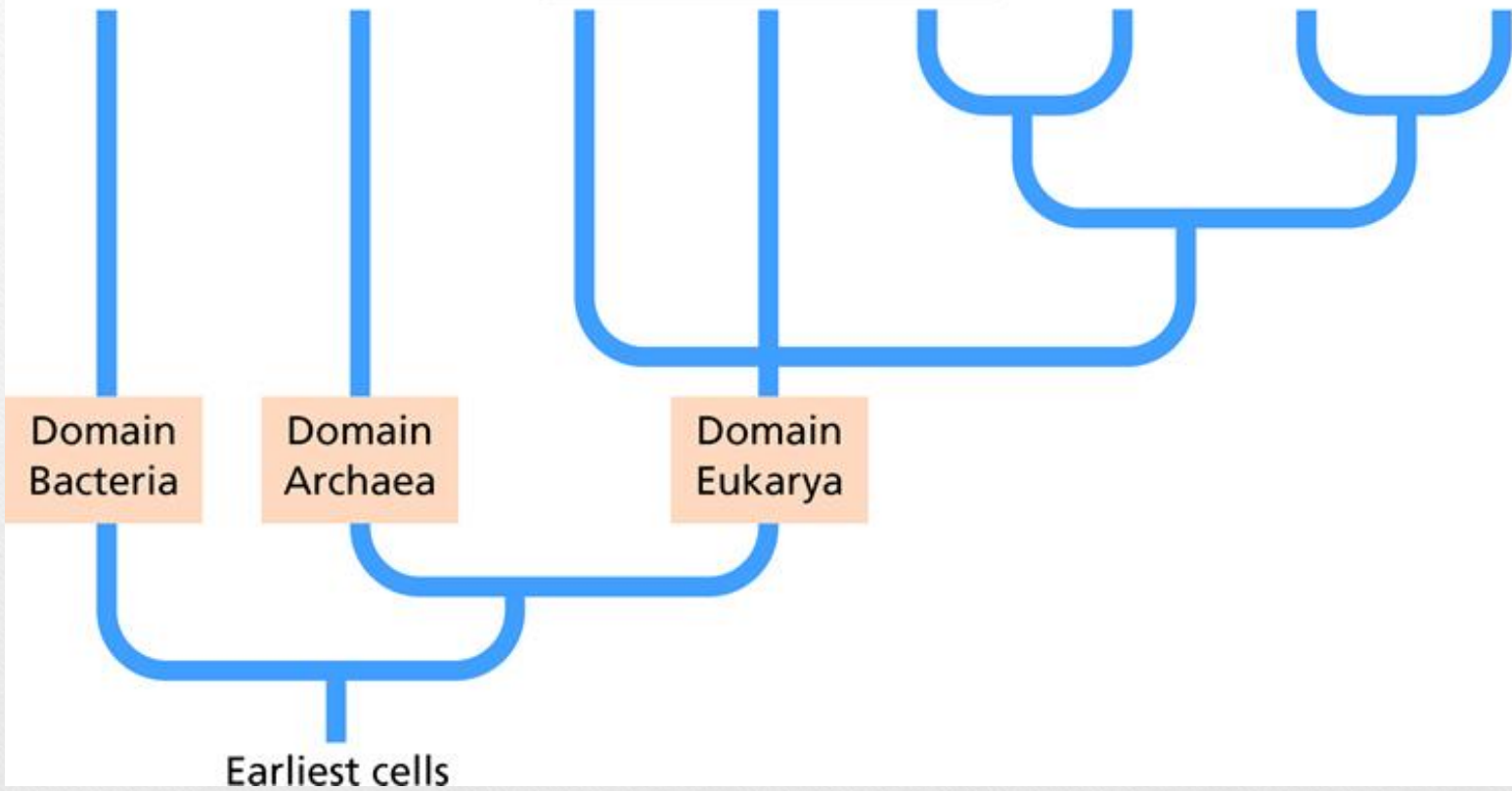
Plants



Fungi



Animals



# Characteristics of Life

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In order to be classified as a living thing, organisms must meet the following 7 criteria:

1. Composed of cells and have complex cellular organization
2. Required energy which is usually in the form of ATP( adenosine triphosphate)
3. Display hereditary characteristics that can be passed on through their genetic material (DNA)
4. Respond to environmental stimuli such as light, heat, touch, etc.
5. Display heredity by carrying DNA and passing it on to their offspring.
6. Evolve and adapt to their environment (Ex. antibiotic resistant bacteria).
7. Reproduce themselves either sexually (2 organisms) or asexually (1 organism).

# Phylogenetic Trees

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- A *phylogeny*, or *evolutionary tree*, represents the *evolutionary* relationships among a set of organisms or groups of organisms, called taxa (singular: taxon).
- The tips of the *tree* represent groups of descendent taxa (often species)
- The nodes on the *tree* represent the common ancestors of those descendants.

